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DETERMINING THE SAFETY AND QUALITY OF PACKAGING IN SOFT DRINKS BASED ON MICROBIOLOGICAL INDICATORS AND THE IMPACT ON THE ECONOMIC COST

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Abstract

The importance of research is to investigate and present the significance of safe packaging of fruit juices, based on microbiological indicators and determination of their impact on economic cost. The purpose of this research is to study some microbiological indicators and determine their impact on economic cost in the packaging of soft drinks.

Samples for microbiological analysis were taken from non-alcoholic beverage packaging produced in the Royal Beverage processing industry, before and after disinfection with ClO_2 and rinsing in bottle filling lines, before and during the production process. The microbiological indicators that have been studied are the total coliform bacteria, *E. coli*, aerobic mesophilic bacterial and fungal microflora (*yeasts and molds*). For determination of microbiological parameters was used membrane filtration method using filters 0.45 µm pore size for bacteria and 0.65 µm for yeast and molds. Enumeration of bacteria is made by counting colonies on plates with Endo agar, PCA, Mac Conkey agar, and RBA agar. During the research, we mainly used chlorine dioxide (ClO_2) with a concentration of 0.2 - 0.5 mg/L. Disinfection is performed through automatic pumps for dosing ClO_2 dosed in water. The determination of the amount of disinfectant was done with the photometer MD 600, the amount of which should be 0 mg/L. During the process of studying the microbiological parameters, has been studied economic cost of disinfection in a period of six months and it has been calculated how this cost affects the price of beverage production. The variables which has been studied are variable costs like ClO_2, water costs, the work of technicians, technologist, microbiologist and fixed costs, utility costs and equipment depreciation.

The results showed that the disinfection process that was used during the research was effective in packaging. Out of 2,376 samples taken, only 5% of them resulted in the presence of aerobic mesophilic bacteria, which is within the allowed norms 10 CFU/10 mL sample, in accordance with the standard ISO 22000 - HACCP. The treatment has an affordable economic cost considering the importance it has in hygiene and the quality of the products.

By using these methods we have achieved satisfactory results with a small percentage of microorganisms within the allowed norms, with small side effects and at an affordable economic cost. Microbiological quality should be monitored since the high microbial load makes them a health risk.

***Key words**: Safety, packaging quality, Microbiological indicators, Economic cost, Disinfectant.*